Machinery Leasing and Custom Services by Cooperatives and Other Dealers

United States Department of Agriculture

Economics, Statistics, and Cooperatives Service

Farmer Cooperative Research Report No. 14

Lloyd C. Biser

MACHINERY LEASING AND CUSTOM SERVICES BY COOPERATIVES AND OTHER DEALERS; by Lloyd C. Biser, agricultural economist; Cooperative Marketing and Purchasing Division; Economics, Statistics, and Cooperatives Service; U.S. Department of Agriculture. Farmer Cooperative Research Report No. 14.

ABSTRACT

When earnings decline in the face of rising production costs, farmers may find leasing and renting more attractive than owning their equipment. This study provides information to cooperative machinery dealers and production credit associations on the benefits, drawbacks, and potential of leasing and custom-service programs. The farmer, who stands to pay 25 percent of total production outlay on direct machinery costs, could save through a nonownership program, depending on acreage, type of equipment, and time of usage. For example, it would be cheaper to lease than own a 120-horsepower tractor when used no more than 500 hours annually. At less than 250 hours of annual use, it is more economical to lease than own any farm tractor.

Keywords: Farm machinery, Leasing, Cooperatives.

Washington, D.C. 20250 November 1979

CONTENTS

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Stock Number 001-000-04072-3

The young and new farmer, the established farmer borrowing heavily to expand operations, and all who have earnings of 5 percent or less must find a practical way to reduce operating costs to a manageable level. One alternative is to lease rather than purchase farm machinery when farm prices are low or the cost of owned machinery nears 25 percent of total costs. Farmers could realize various savings by leasing equipment, depending on acreage, type of equipment needed, and time of usage. A farmer would find it cheaper to lease rather than own a 120-horsepower tractor used no more than 500 hours annually. It is more economical to lease than own any farm tractor used less than 250 hours annually.

Machinery-leasing services have been initiated in some areas by production credit associations (PCA), farmer supply/marketing cooperatives, and other agribusiness firms.

Cooperatives in six regions of the Midwest successfully operate machinery-leasing programs and earn an average return of 3 percent on investment. Local PCAs have proven they have the capability to serve the machinery-leasing needs of farmers.

Some large supply/marketing cooperatives lease farm machinery to members at community rates in 100-mile trade areas. Separate departments for leasing are set up to handle the increased volume. Some cooperatives provide custom services in dry and liquid fertilizer application, herbicide spraying, soil fumigation, and the designing of irrigation systems. Other dealers custom farm one field or entire farms and rent sprayers, tanks, trucks, and trailers for onfarm and off-farm use.

Since farmers spend $2 billion annually to lease farm machinery and obtain custom-machinery services, dealers will see fit to meet the demand. A firm in California, for example, leases machinery worth $10 million to farmers throughout the State. Rental rates are fixed, and farmers know the exact cost before leasing or use.

Managers of local cooperatives say they gain opportunities to serve more farmers through machinery-leasing programs. Many other cooperatives, however, operate under conditions which limit the potential for financial growth and/or farm-machinery leasing.

Local machinery-leasing programs organized by regional cooperatives, including manufacturers, could increase the leasing potential of local cooperatives. Operating as a transfer dealer for the manufacturer, the regional cooperative could allocate leasing equipment to specified local cooperatives as needed. Coordinating leasing activities over a statewide area would provide the volume needed for efficient operation to service leasing needs. A large cooperative dealer could also coordinate operations with the manufacturer and other local dealers with shared regional support and management input.

Many local cooperative credit associations, such as PCAs, want to provide other needed services, such as leasing farm machinery. The outlook for expanding leasing services improves as local associations gain experience. Meantime, they may consult with district and Federal Farm Credit boards and offices to determine policy and favorable business practices.

Machinery Leasing and Custom Services by Cooperatives and Other Dealers

*Lloyd C. Biser**

INTRODUCTION

The consistent trend in U.S. agriculture to increased mechanization has enabled the farmer to farm more acreage and thereby reduce per-acre production costs. However, escalating prices in recent years have triggered more borrowing. Today, direct machinery costs make up 25 percent of total production costs. At this rate and when product prices are low, many farmers are caught in a price-cost squeeze. The problem is most serious for the young, the new, and the marginal farmers who cannot meet their production costs--much less make payments on new farm machinery.

This study examines the extent, success, and problems of leasing, custom farming, and renting policies, particularly the Production Credit Association (PCA) program in coordinated operations with cooperative machinery dealers. It also provides information to other cooperative dealers on how best to support the farmer while maintaining a financially practicable operation.

Farm organizations and individuals provided machinery services valued at $1 billion in 1977. PCAs and farm-machinery cooperatives realized $10 million from leasing farm machinery and equipment that year. Cooperatives have saved farmers money by helping reduce both their production and operating costs, assuming that leasing machinery for short periods is more economical than purchasing it.

Research and study cannot lower farm-machinery prices when they are established on built-in escalating costs of production. Machinery prices are particularly burdensome when farm prices fall, so farmers stop buying machinery. Sales go down, inventories build up, and both manufacturers and dealers search for ways to put more machinery into the hands of farmers.

But some farmers cannot justify buying. If they cannot enlarge their farming operation, their only alternative is to reduce machinery costs and capital outlay through: leasing farm machinery, hiring of custom-machinery services, and/or contracting for custom-farming services.

Farm machinery may be leased from some supply/marketing cooperatives and PCAs for 5 to 25 days a year--depending upon the type and kind of equipment--for less than the interest cost of the original purchase investment. On this basis, much of the planting and harvesting equipment and that extra tractor for busy work periods may be leased cheaper than it can be owned.

* The author is an agricultural economist with the Cooperative Marketing and Purchasing Division, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture.

Farmers spent nearly $2 billion to lease and obtain custom-machinery services in 1977. That was about 10 percent of the total amount they spent to purchase and operate farm machinery. On the other hand, farmers received income of nearly $1 billion from other farmers for such work as combining grain and soybeans, baling hay, and filling silos.

Two groups of farmers have more serious cash flow problems than others--those who entered farming since 1973, and those who borrowed capital to expand operations. Equity earnings for these farmers today is near the 5-percent level--far below the normal 20 percent. With capital costing 9 percent or more, losses in farm operations are increasing to the point where many are trading down machinery and renting more farm machinery to reduce operating costs. These farmers may be helped by a cooperative leasing program.

Farmers must balance costs against returns to determine whether to own, custom hire, or lease farm machinery. These problems need study and analysis to provide information and direction to farmers and to encourage cooperatives to provide useful new services.

PROCEDURE

Basic operating data were obtained from PCA officers, directors, and managers and cooperative dealers active in farm-machinery leasing, renting, and custom farming. Analysis is made to determine the extent of services rendered, to develop findings that will aid in service performance, and to make recommendations for improved performance in cooperative services.

Business policies and practices are studied to aid the lessor in selecting, financing, operating, and maintaining a farm machinery-renting and -leasing program and/or custom services. Custom farming is examined as an alternative operation, while guidelines are developed to help farmers and others determine when to lease or purchase farm tractors.

Leasing as used in this report includes both renting and leasing for cooperatives. All equipment leased from PCAs (cooperative) is covered by a leasing contract, regardless of time used.

Renting is used in this report to describe the renting of farm machinery by a corporation. All renting of machinery is covered by a signed contract, regardless of time used, as in the case with cooperatives. Corporations rent machinery, while cooperatives lease machinery.

Information also is included on custom services involving the use of specialized equipment.

LEASING SERVICES OF PRODUCTION CREDIT ASSOCIATIONS

More than 5 years ago, the district PCA board in Kentucky and the Farm Credit Administration in Washington, D.C., approved a farm machinery-leasing program at Mammoth Cave, Ky. Since then, five PCA districts in the Midwest have initiated similar programs.

The six PCA districts operating machinery-leasing programs were visited, and personal interviews were held with managers and board members to acquire data for analysis of program operations.

An average of seven counties make up a district which includes three machinery-leasing centers that serve as machinery storage and operation headquarters. Facilities at two of the three centers are usually leased, and those at one are usually owned by the PCA. Often leasing centers occupy the facilities of former farm-machinery dealers.

Starting a Machinery-Leasing Program

When farmer members of PCAs request a machinery-leasing service, a survey and study is made to determine the need. If the need is evident, the board generally will approve a program.

An executive committee of the board generally assumes responsibility for the operation, oversees equipment purchase, and determines rate structure and use. The program is operated on a self-sustaining basis and total investment does not exceed 10 percent of the association's capital and surplus or reserve. Equipment purchases are limited to farm equipment and machinery from local dealers, and only those stockholders eligible to borrow from the association will be permitted to lease.

Capital Invested in Machinery and Facilities

The six districts had in 1977 an average of $387,700 invested in machinery and $33,650 invested in owned and leased facilities for a total of $421,350. The range was from $65,000 to $800,000. Average investment per operating center was $140,000--$11,220 in facilities and $129,230 in farm machinery and equipment.

All machinery and equipment was purchased at the lowest bid price from farm-machinery dealers, including cooperatives, in the area. Generally, the bid price will be 10 to 15 percent below list price. All major repairs to equipment are made at regular prices by the dealer from whom the equipment is purchased.

PCA Membership and Leasing Members

The average farmer member is 50 years old, owns 200 acres and rents another 50 acres, milks 40 cows, earns a gross income between $20,000 and $30,000 annually, and owes a debt of $100,000.

The average leasing member pays $750 annually to lease or rent farm machinery. This amount is counted as a production cost for tax purposes.

About 1,000 members are served by one machinery-leasing center and 50 PCA members, or 5 percent, lease farm machinery and equipment.

Operating the Leasing Program

The leasing center manager handles the everyday operations, including scheduling, transportation, and light repair of equipment. When costs exceed $100, the work is checked with the director of leasing or the PCA manager before repairs are made on the equipment.

Scheduling becomes routine once the leasing operation is set up, and the manager knows where each piece of equipment is in use. About 75 percent of the farmers schedule leasing use ahead of actual need. Problems arise when equipment is exchanged between leasing centers, and breakdowns occur in the field.

The farmer pays for transporting equipment from the center nearest the farm and returning it, or he picks up the equipment and returns it. Transportation charges vary from $1.50 per mile to 50 cents a loaded mile up to a maximum of $35, to $15 a round trip, and to a flat fee of $10 for the six PCA districts.

Rates are planned to exceed costs. They are determined on the basis of investment and budgeted estimates for use and maintenance, including depreciation, interest, repairs, taxes, and insurance. Thus, if budget estimates for use and maintenance are on target, the rates charged the farmer will return a fair margin on machinery-leasing operations to the PCAs.

Rates will vary by farming area, type and kind of soil, size of equipment, hours of use, and between PCA centers and regions. As a general guideline, table 1 shows average rates for the six district PCAs in the four-State area. In general, the shorter the lease term, the higher the cost; however, PCA leasing rates are generally in line with custom rates in the community.

The hourly leasing rates in table 1 are an average of the rates charged by the 18 leasing centers of the six district PCAs. Thus, no one rate identifies a particular area or leasing center except by chance. However, the average rates are representative of hourly charges and may be used as a check or starting point in an area. The hourly rates will decrease as the number of hours of tractor use increases. However, the minimum daily rates are basic and will apply if total hourly use for the day does not equal the minimum daily rate.

Production Credit Associations lease farm machinery only to members. Nonmembers may request the use of the service, and by purchasing a share of stock, may become members and eligible to lease equipment. Farmer membership has increased in all the associations leasing farm equipment.

Leasing charges may be paid in cash or through a loan from the PCA. Credit is not granted and usually a portion of the costs, if paid in cash, is required when the equipment is leased.

Table 1--Average leasing rates for farm tractors leased by six Production Credit Associations, 1977

Tractor horsepower 1/	New tractor cost	Hours of use and charge per hour 2/				
		Under 125	126 to 250	251 to 500	Over 500	Minimum daily
		Dollars				
40	8,000	8.00	7.00	5.50	5.00	50
60	12,000	9.00	8.00	6.50	6.00	60
80	15,000	10.00	9.00	7.50	7.00	70
100	22,000	12.00	10.00	8.50	8.00	80
120	27,000	14.00	12.00	10.50	9.75	90
160	30,000	17.00	15.00	13.50	12.50	100
200	40,000	20.00	18.00	17.00	15.50	120

1/ Drawbar horsepower.
2/ PCAs and cooperative dealers.

Problems Affecting Leasing Operations

Leasing farm machinery is a new venture for PCAs. Managing an exclusive operation in deference to dealer leasing with option to purchase is a new dimension in farm-machinery leasing. Few guidelines have been developed to test and gage operational procedure. Thus, problems continue to rise and corrections continue in program operations. Some of the problems cover priority areas of operations, such as the rate of return on capital and the amount of capital loaned to farmers.

Return on investment has been near a break-even level. This is a departure from PCA policy and expectation. On the one hand, leasing rates cannot be set so high that they discourage participation, while receipts must exceed costs in order to continue program operation.

In the beginning, operational-versus-service conflicts affect every decision to be made. Does the association purchase all equipment requested by farmers? How many users will be lost if specified equipment is not purchased? How many leasing centers should be opened in order to put equipment close to farmers and lower their transportation costs? How much will overhead and management costs increase when centers are added?

Type of Equipment for Leasing

Most PCAs make investment decisions on the type and kind of equipment to purchase by surveying their members. The surveys are reliable indicators in some areas, but not in others. Thus, some equipment is purchased that is seldom used or leased. Elsewhere, too much equipment hinders a profitable return on investment at going community leasing rates. Equipment purchases are largely a trial-and-error experience, so more time will be required to determine what equipment farmers in each area need.

Number and Location of Leasing Centers

The general assumption of PCA management is that the closer the leasing center to farmers, the greater the probability of the farmer using the service. This is accepted, even though use of a leasing service depends on a number of other factors of economical and psychological impact.

A tradeoff of options exists for the farmer who has crossed the psychological barrier to lease equipment and makes the decision based on economics. While the extra cost for round-trip transport may be justified if equipment is leased for 10 days, is it economically feasible for two days? When timing is so very important at harvest time, for instance, how long will the equipment be in transport? Thus, the location and distance of the leasing center has a variable impact on use or nonuse of leasing equipment at the farm.

The number and location of the leasing centers have an equal impact for the lessor. How much business will be lost if the association covering a six-county area operates from only one leasing center, which will reduce overhead and operating costs? Several associations have set up four to six leasing centers, while several have one or two experimental operations. All but one of the associations have leased machinery fewer than 2 years, so it is a pioneering and learning experience. An analysis will yield some guidelines for successful operation once data are accumulated.

Improving the Leasing Program

More than 12 percent of PCA members indicated that they would participate in a machinery-leasing program if one were started. Association management had projected a feasible operation if 10 percent of members participated. Actually, member participation has averaged only 5 percent for the associations involved in leasing.

Some associations have leasing problems and have looked for ways to increase volume, reduce direct costs, lower overhead, and increase returns on investment, while continuing to operate a successful leasing program.

Increasing Net Earnings and Improving Return on Investment

Returns on investment averaged 3 percent for the six associations--with several breaking even and several earning a 5-percent return on investment. Leasing revenue of the associations has averaged 29 percent of total investment in machinery for leasing. Management has projected a successful operation if leasing volume equals 39 percent of total investment; this is supported by the experience of several associations. Analysis of individual operations indicates no clear-cut operating procedures guaranteeing success. Charging higher rates to cover investment costs, or lower rates to increase volume, had little affect on investment returns or volume of leasing. However, adjustments in operations continue in the search for the right combination of factors needed to provide the service.

An average of 3-percent return on investment is not adequate to provide machinery-leasing services; hence, adjustments are being made to budget operations to cover all costs and allow an acceptable return on investment. Along with rate increases, associations are putting on educational programs to inform and encourage members to lease equipment when it is to their economic advantage. While the educational effort is designed to aid economic operation at the farm level, it will also help the association increase its volume of business and provide a leasing service at a rate members can afford.

Adding More Leasing Centers

Attaining an adequate volume with reasonable earnings may be possible by increasing the number of leasing centers. There is no doubt that more leasing centers closer to the user will increase leasing volume. However, management and overhead costs generally counteract the increase in volume, so that earnings show little change. One association has successfully held costs in line by working directly with farm-machinery dealers, including a cooperative. The dealer from whom the association obtains the equipment schedules its use, makes delivery, and keeps equipment in good repair. The problem of coordinating the operation in this manner prevents other machinery dealers from bidding for the right to sell equipment to the association and/or repair and service such equipment. Dealing with one dealer does not contribute to good business community relations, but it provides economy and savings.

Another association, in operation for a longer time, is closing leasing centers where costs have exceeded expectation or the amount budgeted. Management is convinced that expansion of leasing centers promoted the purchase of too much machinery, which increased overhead investment costs so that earnings actually decreased from budgeted amounts.

One association operates a number of mini-leasing centers from members' farms. This has not worked too successfully; factors such as the kind and amount of equipment purchased, the type of farming, the area, and direct management over the mini-centers are assumed to be contributing factors to problem operations. If handled and operated efficiently, mini-centers could be successful.

Persuading the Member to Lease

Low member participation in a machinery-leasing program is a combination of two factors--psychological and economical. According to association management, the farmer's psychological reservations can only be overcome by economic persuasion. Associations are holding information meetings and seminars among their members to educate farmers to the economic reality of leasing farm machinery (when it is cheaper to lease than own). Sometimes, education has a slow payout and benefits may accrue too late for some associations; however, it is insurance in the long run for a successful operation.

Associations have expanded operations, purchased more equipment, opened more leasing centers, and even reduced rates in order to increase volume. They have purchased specialized equipment, promoted fall and winter specials, lowered transportation rates, and stepped up service to increase volume and put machinery to work. At times, and in different areas, all of the methods were effective. However, some methods worked to defeat the problem they were to solve. For instance, some associations purchased too much equipment and opened too many centers so that costs later became prohibitive. These associations are selling their least-used equipment and closing down some leasing centers.

Ownership costs, including depreciation, interest, repairs, taxes, and insurance, constitute the heavy costs. Like the farmer who owns his equipment, the association finds these costs excessive when equipment is idle.

To lower costs of equipment repair, one association works directly with a cooperative machinery dealer who does all repair work for the association. All machinery and equipment is purchased from the cooperative dealer, except for specialized equipment handled by two smaller equipment dealers who also operate on contract as leasing centers in their respective areas. Operating costs have averaged lower for this association.

Leasing centers are checking "leasing time" contracts thoroughly, inspecting returned equipment more closely, and eliminating management overhead in order to reduce operating expenses. One association is reducing the number of leasing centers by 40 percent for better control and efficiency of operation. Others are selling excess equipment and seldom-used machinery because of little demand. Management personnel has been reduced. Reductions in operations in some associations and expansion in others is providing experience in adjusting operations throughout the leasing program.

LEASING SERVICES OF SUPPLY/MARKETING COOPERATIVES

About 30 cooperative dealers leased or rented farm machinery to nearly 400 farmers in 1970; however, only a few cooperatives leased machinery for long periods of time. Half the cooperative dealers leased or rented machinery by 1977. Most also provide custom services which will be discussed in a later section of this report.

Six cooperative dealers were contacted about their machinery-leasing operations. They served farming areas less than one-sixth the size of the leasing areas of PCAs. The leasing program of cooperative dealers is secondary in business and interest to machinery sales, though renting and leasing volumes have doubled since 1970.

304-968 O - 79 - 2

Starting a Machinery-Leasing Program

Machinery leasing started about 10 years ago for most of the cooperatives with a noticeable upturn in activity the last few years. This increase in activity began as farm grain prices started their recent decline. More machinery will be leased, managers say, as farmers look for ways to lower costs of production.

Unlike the PCAs, cooperative dealers franchise machinery for one or several manufacturers and are set up in fixed facilities for repair and service to members; and hence, they are not faced with the problems of acquiring leasing centers and purchasing facilities and machinery. As some look toward expansion, they contemplate some problems in center locations; however, to date, their only expansion has been to branch locations of the cooperative.

Cooperatives strive to meet the need as members request the service. Heretofore, requests and operation of the leasing activity have been handled by the machinery department, but with demand increasing, cooperatives are beginning to set up separate sections within the machinery department to handle the leasing operations.

Operating the Leasing Program

Usually the assistant manager of the machinery department is responsible for operation of the leasing program, schedules machinery use, delivers the equipment, and collects the advance payment for expected use.

Farm Machinery-Leasing Rates

The most important part of the operation is setting rates that are equitable to both lessor and lessee. Cooperatives not only take into account the going community rates, but also survey other dealers and cooperative members to arrive at fair rates.

A wide variation exists in leasing rates from east to west for the six cooperatives and for different types of farming areas. Rates for tractors range from $12 to $20 an hour; combines, $30 to $40; plows and disks, $2 to $4 per acre; seeding equipment, $3 to $5 per acre; and hay balers from 15 to 20 cents per bale to $4 and $5 a round bale. Each cooperative makes a number of rate adjustments, rather than holding to a fixed standard during the year. While primarily interested in sales, they set priorities for service to members and, at times, lease at or below cost as a method of promoting new sales.

Some cooperatives lease farm trucks at the rate of $1,000 per month. A different and higher rate is set for a corporate farmer or a nonfarm corporation. Knowing the farmer and how he takes care of equipment affects the rate charged for trucks and equipment and the amount of downpayment or prepayment due for use of equipment. For trucks as well as farm equipment, rates are flexible and depend upon individuals, corporations, and applicable conditions at the time.

Return on Investment

The receipts from machinery leasing amount to less than 5 percent of total sales for most cooperative dealers. It is an extension of the main line of activity operated as a service to members. Consequently, it was not expected to make a profit, nor always to meet the cost of operation. Any losses would be made up from margins on sales of new and used equipment. Now, however, with leasing demand on the increase and more capital invested in equipment, repair, and upkeep, the leasing program is expected to pay its own way and earn a modest return on investment.

Added costs have followed the increase in leasing activity causing cooperative management to take a closer look at the operation. Generally, a new department of leasing is set up within the machinery division. Operations are scrutinized and rates adjusted to assure a return on investment, since the new department is expected to operate efficiently and show a savings. Unlike the PCAs, the cooperative department is not required to operate profitably, but equitable treatment of members suggests the leasing program be self-supporting.

MACHINERY RENTAL BY A LARGE INDEPENDENT FIRM

This study covers the operations of a large California firm, which started renting out farm machinery in 1969. Demand increased to where its investment in owned machinery reached $10 million, and it leased another $10 million worth in early 1978.

All tractors are less than 2 years old, and other machinery is maintained in like-new condition. The company is responsible for downtime and will repair machinery within 24 hours or replace it within 48 hours. The farmer is responsible for transportation costs, insurance, and damage due to abuse or neglect.

Service Area

The firm serves farmers operating 200 to 2,000 acres throughout California. Operations are conducted from four main centers--two in the San Joaquin Valley, one in the Imperial Valley, and one in the Sacramento Valley. Transportation rates determined from one of the four centers are shown in figure 1. Each of the centers has preventive maintenance facilities. Each operates separately but coordinates use and transfer of machinery with the other centers. This method of operation allows the firm to serve all farmers in the State at community rental rates and reasonable transportation costs.

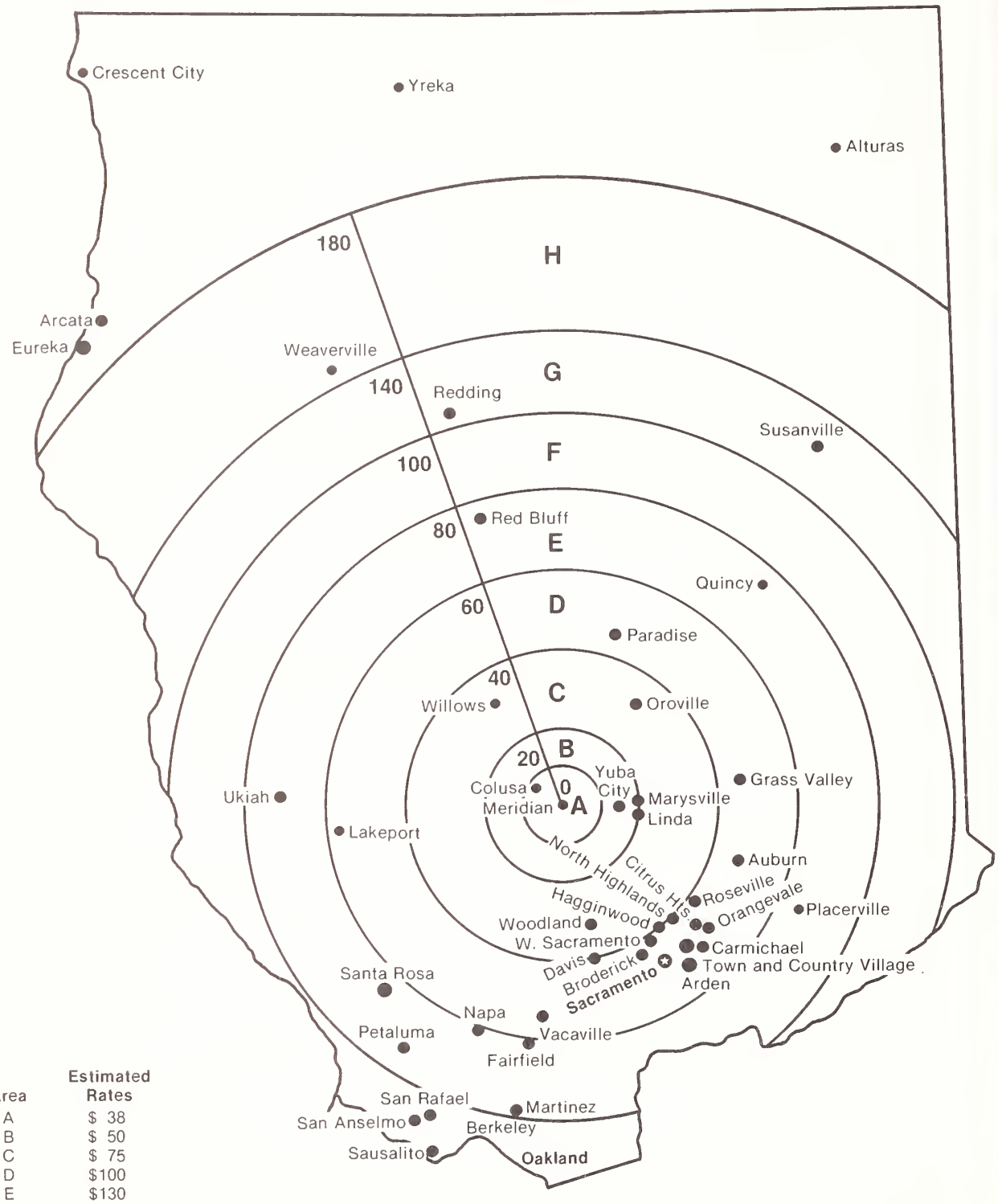
Rental Rates

Unlike cooperative dealers, who make rate adjustments to some members, rental rates are set by company management and apply equally to all farmers served from the four operating centers. Since cooperative management has reason to know those members who take care of machinery and those who do not, they can, to some extent, justify flexible rates. On the other hand, a rigid rate structure may be justified when renting machinery to farmers throughout the State.

Rental rates, however, are flexible based on hours used per day and the number of days used (appendix table 9). Like the cooperatives, rates also vary with size of tractor and kind and size of farm equipment rented. For example, a tractor of 108-drawbar horsepower (DBHP) used 5 hours per day for 5 days would cost $13.30 per hour plus transportation. If used 10 days for 5 hours each day, the cost would decrease to $11.05 per hour and if used 10 days for 10 hours per day, costs would further decline to $9 per hour. While the basic rental rate for a few days appears high, heavy daily use for a week or two lowers substantially the hourly cost of renting farm machinery (table 2). This flexible rate feature is more complicated and detailed than either cooperative or PCA rate schedules. It encourages farmers to plan machinery use carefully, reducing transportation costs and improving operating efficiency for the firm.

Figure 1

Service and Transportation Rates for the Sacramento, California Valley Center



Area	Estimated Rates
A	$ 38
B	$ 50
C	$ 75
D	$100
E	$130
F	$155
G	$180
H	$220

Table 2--Rental rates based on hourly and annual utilization and size of tractor

Tractor horsepower and days used 1/	Average hours used per day						
	3-4	4-5	5-6.5	6.5-8.5	8.5-11	11-14	14-24
	Dollars						
135:							
3-5	19.00	16.90	14.80	13.20	11.65	10.30	9.35
6-9	17.05	15.30	13.35	12.25	10.65	9.55	8.80
10-15	15.65	14.10	12.30	11.20	10.00	9.00	8.35
16-22	15.05	13.40	11.65	10.70	9.55	8.70	8.10
23-30	14.70	13.10	11.30	10.45	9.35	8.60	8.00
2nd-30	14.40	12.75	11.00	10.20	9.10	8.50	7.90
3rd-30	14.20	12.50	10.80	10.05	9.00	8.40	7.75
4th-30	14.00	12.35	10.70	9.95	8.95	8.35	7.60
108:							
3-5	17.10	15.20	13.30	11.90	10.50	9.25	8.40
6-9	15.35	13.75	12.00	11.00	9.60	8.60	7.90
10-15	14.10	12.70	11.05	10.10	9.00	8.10	7.60
16-22	13.55	12.05	10.50	9.60	8.60	7.80	7.30
23-30	13.20	11.80	10.20	9.40	8.40	7.75	7.20
2nd-30	12.95	11.50	9.90	9.20	8.20	7.65	7.10
3rd-30	12.80	11.25	9.70	9.05	8.10	7.55	6.95
4th-30	12.60	11.10	9.60	8.95	8.05	7.50	6.80
86:							
3-5	14.70	13.05	11.40	10.20	9.05	7.95	7.20
6-9	13.20	11.80	10.30	9.45	8.25	7.40	6.80
10-15	12.10	10.90	9.50	8.70	7.75	7.00	6.50
16-22	11.65	10.35	9.00	8.25	7.40	6.70	6.30
23-30	11.35	10.15	8.75	8.05	7.20	6.65	6.20
2nd-30	11.10	9.90	8.50	7.90	7.05	6.55	6.10
3rd-30	11.00	9.65	8.30	7.75	6.95	6.50	5.95
4th-30	10.80	9.50	8.25	7.70	6.90	6.45	5.80

1/ Drawbar horsepower.

Ownership Compared with Rental Costs

Crawler tractors are used heavily in western farming areas and are in great demand for lease and rental. Only large farmers can economically afford to own a crawler. A crawler (125 DBHP) must be used 1,600 hours annually for ownership costs ($18.54 per hour) to be less than costs of rental ($18.61 per hour).

Table 3 details ownership costs for crawler utilization. Although not shown, at 600 hours, total ownership costs per hour are $29.27, and for 800 hours, $24.98.

Rental costs per hour of a new crawler used 1,200 hours annually amount to $18.61, compared with ownership costs of $20.69 per hour--or $2.08 per hour less (table 3 and appendix table 13).

If the crawler is rented for 12 days and used 10 hours each day (120 hours utilization), the rental and operating cost would amount to $21.81 per hour. Renting for only 5 days would cost $24.81 per hour. Thus, for short rental periods, costs are higher but still below ownership costs of $29.27 per hour--even when used as much as 600 hours annually.

Figure 2 shows a comparison of the costs of owning-versus-renting new and used crawlers. At a rental rate for 200 hours per month, renting a new crawler is cheaper than owning one for the first 1,110 hours of annual use. Ownership is more economical after 1,100 hours use. At a rate for 400 hours per month, renting is cheaper for the first 1,600 hours after which ownership becomes more economical.

EVALUATION AND OUTLOOK FOR MACHINERY-LEASING PROGRAMS

Success or failure of a leasing operation cannot be measured or judged by the bottom line figures, particularly when they represent only 1 or 2 years' operation. The circumstances surrounding conditions under which the program operated must be taken into account. Some other factors that should be considered in evaluating cooperative machinery-leasing programs are that: (1) many leasing programs are new, (2) guidelines for successful operation are almost nonexistent, (3) rate structures are complicated and must be developed over time, and (4) cooperative management lacks general experience in operating a machinery-leasing program.

Production Credit Leasing Programs

All but one of the PCAs were operating new leasing programs during 1976. All served at least a six-county area, and thus have a sufficient potential volume to operate successfully. All but one association were operating without proven guidelines, and all the associations were experimenting in developing fair leasing rate schedules. Meantime, the Farm Credit Administration expected them to show a fair rate of return on this investment within a short time. Some associations found it very difficult to meet operating requirements under these circumstances.

Starting a Program

Local associations determine a need for farm-machinery leasing in their area. When support in several counties is evident, the regional association of county locals will set up and operate a leasing program. Machinery and equipment are purchased with the expectation that 10 percent of the members will use it. When fewer than expected use the service, costs exceed projections, revenue falls below the projected level, and requirements cannot be met.

Table 3--Ownership costs for a new 125 DBHP crawler tractor at various levels of utilization, 1977 1/

Item	Annual use (hours)			
	1,000	1,200 2/	1,400	1,600
	Dollars			
Salvage value (10 years)	21,300	20,000	19,000	18,000
	Dollars per hour			
Fixed cost				
Depreciation	3.87	3.33	2.93	2.63
Interest, taxes, and insurance	6.10	5.00	4.23	3.66
Variable costs 3/				
Repair	4.59	4.50	4.44	4.39
Lubricants 4/	.25	.25	.25	.25
Subtotal	14.81	13.08	11.85	10.93
Operating costs				
Fuel	3.36	3.36	3.36	3.36
Filters 4/	.25	.25	.25	.25
Labor	4.00	4.00	4.00	4.00
Total	22.42	20.69	19.46	18.54

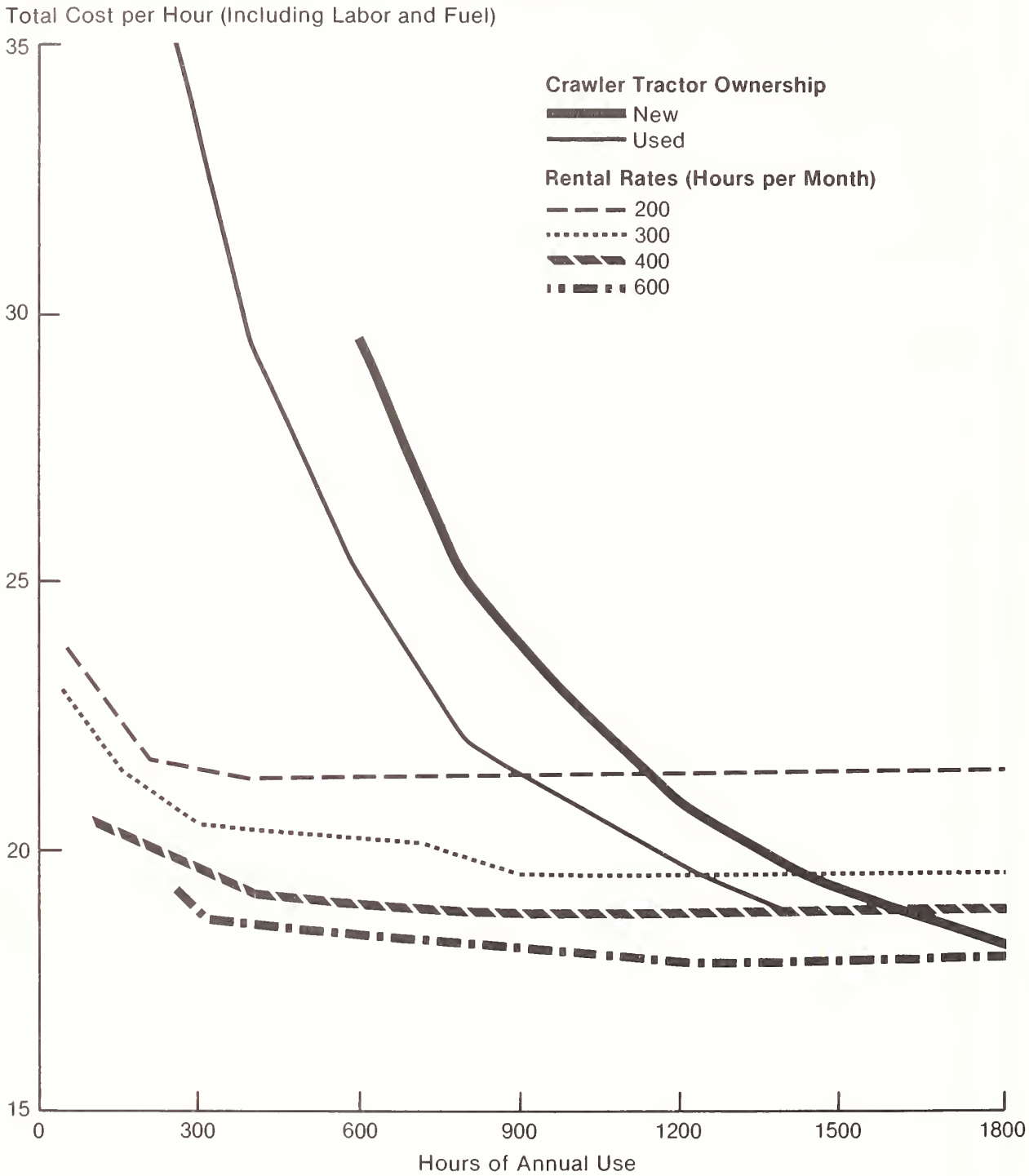
1/ Drawbar horsepower. 2/ Detailed cost estimates for 1,200 hours of use:

Fixed costs	Costs per hour
	Dollars
Depreciation: initial cost $60,000 - salvage value of $20 ÷ 1,200 hours life use.	3.33
Interest: average investment of $40,000 x interest rate @ 10% ÷ annual use of 1,200 hours.	3.33
Taxes and insurance: average investment of $40,000 x taxes and insurance @ 5% ÷ annual use of 1,200 hours.	1.67
Variable costs	
Repairs: initial cost of $60,000 x annual repair factor @ 9% ÷ annual use of 1,200 hours.	4.50
Fuel: consumption of 8 gals. per hour x fuel cost @ .42 cents per gallon.	3.36
Lubricants and filters: fuel cost of $3.36 x 15%.	.50
Labor: operator wage, including overhead.	4.00
Total cost per hour of operation	20.69

3/ Repair factor and fuel from the performance handbook of a major manufacturer.
4/ Lubricant and filter factor from Fundamentals of Machinery Operation.

Figure 2

Rental Costs for Crawler Tractors at Various Levels of Utilization



Rental rate assumes at $7.61 operating cost, including fuel, lubricants, and labor. Where applicable freight is assumed to be within a 40-mile radius of the nearest rental headquarters within a round-trip cost of $100 or a one-way cost of $50. Freight is included in the rental rates illustrated. Rental rates assume consecutive months of use at various utilizations, per month (200, 300, 400, & 600 hours) to arrive at annual utilization.

A normal investment the first year will exceed $250,000 in machinery and facilities. If members have a bad crop-year or early winter freeze, profits from fall plowing, for instance, turn into losses. There is no sure way to guarantee profitable operations the first few years considering the circumstances and risks. An evaluation of profit and loss over a 5-year period would seem a fair criterion for measuring performance.

Adjusting Rate Schedules

Management begins to adjust leasing rates to encourage either greater use of equipment or to increase revenue, if operating costs increase and machinery use and revenue decrease. In the process of varying rates, management found that high rates discouraged use and that low rates did not cover all operating expenses. Developing a solid rate base, wherein the rate declines in relation to increase in use, requires analysis of rate structure from operating experiences of several years. Cooperatives, meanwhile, will try to fit a rate structure to the needs of area members.

Most of the local associations hired former machinery dealers or retired dealers to manage the leasing program. Though experienced in sales and repair, the dealers had to learn the leasing program through trial and error. Farmers in every farming area have different ways and methods of operation. While some leasing methods and rate structures were acceptable in one area, the same methods and rate schedules were neither acceptable nor workable in another. Thus, management faced the challenge of developing a program, through experience gained over time, that would be profitable to the association and also serve the needs of members.

Outlook

Many farmers need to lease more farm machinery to reduce operating expenses, particularly during periods of low farm prices. PCA associations have the capital to operate a leasing program. PCAs finance many farm operations, and they know member needs--when they should lease rather than purchase machinery. And PCAs can make it convenient to pay leasing costs. Many local PCAs want to provide lease services as a means of improving farm efficiency and attracting new patrons.

Some PCAs, however, believe that approval of local machinery-leasing programs by the Farm Credit Administration limits the expansion of these programs.

They realize that the farm credit system obtains capital from investors who purchase interest-bearing securities in the open market, and that the system must earn a return on capital invested. They understand that some operating requirements must be imposed in local associations to guarantee adequate earnings. However, some believe that the overall earnings position of the association should be the main criterion of performance. Some feel the local association should be able to operate some programs for farmers at lower than required earnings, or at cost, or even at a modest loss the first few years, if there is a demonstrated need for such a program and if total association earnings meet the requirements of the Farm Credit Administration.

They point out that there is no way the local association can set up a pilot program, purchase machinery, open leasing centers, and guarantee a 5- or 6-percent return on investment in the first or second year of operation. 1/

1/ One question raised was whether the district Farm Credit Boards could establish a reserve for research and education to assist locals in conducting pilot operations that have the potential of broadening services and perhaps attracting new members and business.

There appears to be a need for better understanding among local PCAs as to the responsibilities and requirements of the district-versus-Federal Farm Credit boards and offices concerning additional financially-related services such as machinery leasing. For example, not all knew that when the Farm Credit Act of 1971 provided for broader services each service would be expected to be at least self-sustaining, and that the informal position of the Farm Credit Administration is that leasing programs show a trend toward profitability by the third year.

As mentioned, the need exists among some farmers for leasing services, and some PCAs have demonstrated they can fill this need. The outlook for increased leasing services may turn brighter with proper planning and management and a better understanding of the time period to be permitted for break-even operations.

Cooperative Dealer Leasing Programs

Cooperatives, as well as other machinery dealers, are in business to sell farm machinery--not to rent or lease machinery. The objectives conflict; as more machinery is leased, less machinery is sold. It is possible, however, to operate both programs, but few dealers are successful.

Farm machinery-leasing, except by a few cooperative dealers, is more of a sideline than a primary operation. It fulfills a need expressed by some cooperative members. Where the general manager gives limited machinery support, many cooperative dealers must defend sales and repair operations of the machinery department to the cooperative general manager. Many dealers do not wish to take on another operation which would need defending. Thus, the potential for increasing leasing operations holds little promise for most cooperative machinery dealers.

About 10 percent of cooperative dealers operate an ongoing machinery-leasing program. The leasing program is operated free of machinery sales but tied to the repair and facility operations. It is expected to break even and have a positive effect on sales in the long run.

Operating Problems and Outlook

A main problem is accounting for all operating costs to be charged to the leasing program. A part of the new cost of machinery and some depreciation may be charged against the leasing program, as well as scheduling, transport of equipment, and repair and upkeep costs. When all costs are applied and net losses result, compensating adjustments may be made upward in the rate structure.

Cooperative dealers have made surveys and studied leasing rates to develop an equitable rate structure. They have leaned far to help the small farmer who needs to lease machinery. As a result, rates for machine use and transportation costs on small jobs do not cover the costs of operation. Charging a higher basic rate and reducing it as the hours of use increase, as the private leasing firm has done, could point the direction for greater success in cooperative leasing operations.

The greatest single limitation to cooperative dealer leasing is its usual small-trade area. Only a low volume may be expected when operations are confined to less than a county area, and little room for error exists. An efficient operation must be supported by a finely tuned rate structure and very selective purchases of machinery for lease; thus, a larger trade area is needed to provide the potential volume for successful operations.

Few dealers are successful in leasing farm machinery. The concept applies even more so to cooperative dealers. The cooperative machinery dealer, operating as a

department of the general cooperative, is not free to operate as an independent dealer but must operate within the guidelines of the total cooperative business.

Less than 2 percent of all supply/marketing cooperatives franchise farm machinery. It is a specialized activity--much different from the general farm supply cooperative operation and is usually viewed by cooperative management as a sideline operation. Hence, few cooperative managers give farm machinery operations more than token support.

Cooperative dealers, unlike independent machinery dealers, operate under a divisional or dual management system. This limitation not only hampers machinery operations but also prevents the machinery department from adding new services, such as leasing and renting. In addition, cooperative employees and managers usually work a regular day, while the independent dealer will put in longer hours as needed to make a sale.

While operating limitations of cooperative dealers inhibit leasing operations, the generally small trade areas further limit the potential for increased leasing activity.

In the rich farming area of the Midwest, a large cooperative dealer servicing a trade area with 50-mile radius may have a better than equal chance for successful farm-machinery leasing. In the more open farmland of the Northwest, a large cooperative dealer servicing a 100-mile trade area would have similar prospects for successful farm-machinery leasing.

Alone, the average cooperative dealer has little prospect for operating a successful leasing program; however, leasing potential could be increased if coordinated between the machinery manufacturers and selected cooperative franchise dealers. One cooperative dealer could be designated and supplied additional machinery for leasing purposes and provided a longer payment plan in selected counties with obvious leasing potential. Other nearby cooperative dealers could be involved in supplying some "short-line" equipment or in subleasing operations to members.

Another way to improve cooperative leasing potential would be to involve directly the regional cooperative which would coordinate leasing activities among selected cooperative dealer members. The regional cooperative could become a transfer dealer and distribution center for machinery franchised by its dealers. Savings could be realized in machinery distribution and passed on to participating leasing dealers.

Shared input and financial support by the manufacturer and the regional cooperative would support leasing programs at the local level. At this point, the selected local cooperative dealer would handle operations and share in financial support. A coordinated share-alike program would greatly improve the chances for successful operation.

Only a few cooperative dealers are large enough and have adequate trade areas to justify investment in enough farm machinery to operate successfully a leasing program. Most are too small to justify a leasing program of their own, so a concerted effort is needed to involve the regional cooperative and/or the machinery manufacturer in developing a program for this vital service to farmers. Otherwise, the outlook for cooperative dealer leasing is dark.

The Noncooperative Machinery-Leasing Program

The private firm in this study has gained management experience over time and now operates a successful machinery-leasing program over a large agricultural area.

The surprising feature of the operation is the large area covered in renting farm machinery. California is served from four leasing centers strategically located in the three main farming areas of the State. Other lessors have questioned the economics and efficiency of serving such a large area, but this leasing firm has proved that a large area can be served successfully.

The firm is not typical. It is larger than most machinery-leasing firms--both private and cooperative dealers. It has a rental fleet valued in excess of $10 million. Large machines make up most of the rented and leased equipment, although small tractors and comparable equipment are handled to serve 200-acre, as well as 2,000-acre, farms. Large farms and large operators contribute to the successful operation of a renting and leasing program. However, successful operation is not automatic because it is large; it also is predicated on effective and efficient management.

This firm has developed a flexible rate structure that decreases in rate per hour as machine use increases. This works as an incentive for the lessee to plan use hours carefully and productively. It also encourages savings in transport time and in cost, which are applicable and beneficial to both lessor and lessee.

The farmer knows exactly what the cost of renting machinery will be for any number of hours used. The farmer is not responsible for repairs if the machine breaks down. The firm will repair the equipment within 24 hours or replace it within 48 hours at no cost to the farmer. The farmer pays no more than the flexible rate applicable to use.

Effective management is realized when: (1) center managers and field representatives keep on top of scheduling, breakdowns, and transportation (getting equipment to the lessee on time and picking up equipment promptly at the end of the use period); (2) preventive maintenance is practiced in the center shops; and (3) early trade-ins of frequently used equipment are made before most disabling breakdowns. Most important, it is operating with the expectation of realizing a return on investment.

CUSTOM SERVICES OF SUPPLY/MARKETING COOPERATIVES

Many of the farm supply and marketing cooperatives provide typical custom services for farmers such as feed and petroleum delivery, lime, fertilizer and chemical application, and farm building plans and specifications.

Most cooperatives handling farm machinery provide these services; however, some provide special services for farmers such as subsoiling, soil fumigation, mechanical irrigation, and spraying. The experiences of one western cooperative in custom farming--from land preparation to crop harvesting--and the special services of a cooperative machinery dealer will be considered in this section.

Custom-Farming Services

For 5 years, a transportation and marketing cooperative in Ontario, Oreg., carried on a successful custom-farming program. Custom-machinery operations were performed for any requested farm activity and for entire farms leased by the cooperative.

Originally, custom-machinery operations included only specified farming activities requested by farmers. Demand for custom services required a nearly full-time manager and staff operation. Cooperative management proceeded to lease farms from retiring

owners, as well as leasing idle farmland to justify this investment. Leasing and farming the entire farm proved to be more profitable than planting or harvesting one crop or farming one field on individual farms.

Custom Services for Specified Farm Operations

Most cooperatives find the investment in materials, equipment, and manpower too high to provide custom-farming services to members. One, patterned after the Oregon cooperative, made a strong effort to provide this service to small farmers. Except during one year, the cooperative found that up to 6 months of earnings from most equipment and much less use on other machinery failed to support a feasible operation.

Revenue for the past year at the Oregon cooperative amounted to $138,000. Direct costs equaled $123,000 and indirect costs $21,000 for a total cost of $144,000, resulting in a $6,000 loss on operations.

Labor accounted for 40 percent (or $49,200) of direct costs, and salaries for supervision and overhead salaries amounted to $12,300; thus, total salaries and labor accounted for $61,500, or 50 percent of total cost of operation. Equipment costs accounted for 33 percent of total costs and other overhead costs for the remaining 17 percent.

The inefficient use of labor and equipment both in transport and small-scale operation made it very difficult to earn a profit on operations without charging abnormally high rates for custom-farming services. The cooperative also found that requests generally involved the poorest piece of land and the most difficult to farm. From this experience, management proposed leasing and farming the entire farm as the answer to a more efficient and effective use of labor and equipment.

Custom Farming of Leased Farms

Equipment costs at 7.5 percent of operating costs appear low, while machine hire at 20 percent appears high; when combined, however, they present a true picture of total machinery costs (table 4). Equipment use refers to the cooperative-owned equipment. The decision to hire and lease equipment, in lieu of purchase, was made on the basis of efficient use of cooperative-owned equipment along with maintaining a regular labor force.

Renting and leasing farmland accounts for 29 percent of operating costs and 24.2 percent of total costs. Seed, chemicals, fertilizer, and supplies applied to the land account for 17.5 percent of operating costs and 14.6 percent of total costs.

Management and supervisor costs make up 10 percent of overhead costs, and when added to labor costs, increase total labor to 36 percent of direct operating costs and to 31.7 percent of total costs (table 4).

Custom Services and Custom Farming Combined for all Farmers

Small farmers need custom-farming services to stay in business. Limited in acreage and capital, they cannot afford to purchase the machinery needed. When the cooperative provides these services, it faces the same problems as the small farmer--not enough volume to realize adequate return on investment.

Management at the cooperative believes that larger farmers could help by using more custom services. They believe, also, that larger farmers would be more interested in investing in the cooperative and using the services, if voting power equaled investment. They contend that a mix of custom-farming services on both large and small farms would be a feasible and successful operation.

Table 4--Annual income, operating costs, and net proceeds realized from the Oregon custom-farming operation

Item	Amount	Percentage	
		Operating costs	Total costs
	Dollars	Percent	
Gross income	169,534	--	--
Direct costs:			
Labor and benefits	30,326	26.0	21.7
Seed and materials	20,128	17.5	14.6
Machine hire	24,765	20.0	17.8
Use of equipment	8,925	7.5	6.3
Land rent and lease	34,029	29.0	24.2
Total	118,274	100.0	84.6
Indirect costs (management and overhead)	20,512	--	15.4
Total costs	138,785	--	100.0
Net farm proceeds	30,749	--	--

-- = Not applicable.

The farming division of the cooperative, combining custom services and custom farming, realized total net proceeds of $24,262 on the year's operation (table 5).

Labor was the largest single cost at 34 percent, followed by equipment use at 32 percent. However, when machine hire and equipment use are combined, total machinery cost equaled 42 percent of operating costs.

While the efficient use of labor and equipment is important because of high cost, other factors may determine success or failure of custom services and custom farming, namely:

(1) Determining the lease or rental price of land.

(2) Good, fertile farmland is worth a premium price.

(3) A bargain price must be obtained for poor quality land.

(4) Poor, rundown farmland will take years to reach good production.

(5) Time spent in custom service of land will greatly affect cost.

(6) Land condition, fertilizer, and chemical application will seriously affect cost, yield, and profit.

(7) Recognition by management that some custom operations will lose money.

(8) Ability of the cooperative to withstand losses on custom services and to balance those losses with gains in some other cooperative area.

(9) A balanced capital program for successful cooperative operation.

Table 5--Annual revenue and operating and administrative costs of all custom operations at the Oregon cooperative

Item	Amount	Percentage	
		Operating costs	Total costs
	Dollars	Percent	
Revenue:			
Custom services	138,000	--	--
Custom farming	169,534	--	--
Total	307,534	--	--
Operating costs:			
Labor and benefits	82,900	34.3	30.0
Seed and materials	21,428	8.8	7.5
Machine hire	24,764	10.2	8.7
Equipment use	76,902	32.0	27.0
Land lease and tax	35,460	14.7	12.5
Total	241,454	100.0	85.7
Administrative costs:			
Salaries and benefits	29,666	71.0	10.3
Utilities and depreciation	7,452	17.9	2.5
Office and overhead	4,700	11.1	1.5
Total	41,818	100.0	14.3
Total costs	283,272	--	100.0
Total net proceeds	24,262	--	--

-- = Not applicable.

Subsoiling Fumigation Services

Soil fumigation is about the only practical way to control soil-borne diseases like root knot nematode and verticillium wilt. Heretofore, everyone applied fumigants with a plow which generally failed because the nematodes survived, and the soil blew away. Recently, a new type of service was developed by the Western Farmers Association, Seattle, Wash. A machine was developed at the cooperative, with V-bar subsoiler blades to fluff and raise the ground and place the fumigant 12 inches below the surface on 11-inch centers. The subsoiler is followed by a double disk and cultipacker--the entire rig powered by a 400-hp tractor. The disk eliminates the fumigant's leaks, and the packer seals in the fumigant for maximum effect.

The growth in the cooperative's custom service stems from the fact that the operation is successful, and that temperature and moisture conditions are right for application in the fall when farmers are busy. Thus, local cooperative members can take advantage of this custom service from early fall in southeastern Washington to late fall in central Washington.

The cooperative handles eight types of fumigants to meet four different crop needs. Fumigants are volatile chemicals, applied in liquid form, which converts to gas under proper temperature and moisture conditions. The fumigant remains effective

for months destroying nematodes and other disease organisms in the soil, as long as the soil is properly sealed by disk and cultipacker.

Custom Fertilizer Application and Soil-Testing Services

Cooperative custom applicators are finding advantages in using independent soil-testing firms that do not sell chemicals. When the cooperative tests the farmer's soil and recommends heavy application of dry or liquid fertilizer, especially minor nutrients, the farmer suspects a tie-in between recommendations and added sales for the cooperative. Such suspicion is removed if a private firm does the testing, and the cooperative sells and custom applies the material or leases application equipment to farmers.

Cooperative applicators are going to Tryco floaters, a tricycle-type machine with large flotation tires. It can be equipped with either a tank for liquid fertilizer or for dry plant food and may be used about 8 months out of the year.

Farmers may have the fertilizer applied or have it delivered by the cooperative to their farms. Dry spreaders may be rented separately or, if preferred, their use is included in the price of the fertilizer. Also, fertilizer may be picked up at the cooperative for $5 less per ton.

Corn yields have doubled through irrigation in the last 10 years, but liquid fertilizer application per acre has tripled in that time. Many farmers are going from one preplant application to three applications during the season. New applicators like the Ag-Gator, built high to straddle the crop rows and with regular rear wheel size tractor tires, allows fertilizer application almost anytime during the growing season. It is equipped with a liquid tank that will take suspensions as well as solutions.

Storage tanks for starter liquid may be rented by farmers if they want to apply their own at a savings of $4 to $5 per ton. Ammonia tanks for pulling behind tool bars may also be rented or leased from the cooperative at separate rates or included in the price of the fertilizer. Cooperatives will usually have a sunken building with a storage pit, which can hold up to 1,000 tons of 28-percent nitrogen, since liquid applications have increased from 200 to 300 pounds to up to 800 to 900 pounds per acre in the last few years.

Mechanical Irrigation Services

Cooperative dealers in the Northwest have been active in custom operations which include renting, leasing, setting up, and operating irrigation equipment mainly because demand is greater than in other areas. There also is increasing activity of this type among cooperative dealers in the Midwest.

Northwest cooperative dealers like the branch outlet of Pacific Supply Cooperative (now Farmers Union Central Exchange) at Eugene, Oreg., rent out or lease irrigation injector sets, including suction and pressure line types. Farmers may rent the suction type for $35 for the first 1,000 gallons, and less 1 cent per gallon on the next 3,000 gallons. The pressure line type may be rented for $70 for the first 1,000 gallons and less 1 cent per gallon on the next 7,000 gallons.

The popular self-propelled, center pivot sprinkler system also may be rented, leased, or purchased from cooperative dealers. The cooperative will set up the equipment and/or keep it in operation if the farmer desires. This model, while more expensive, is more economical in the long run, because no hand labor is needed to move the equipment.

Fertigation

"Fertigation" is the term used to describe application of fertilizer in irrigation water. Two jobs can be done at one time by using a pump to inject liquid fertilizer from a holding tank into the sprinkler irrigation system. Nitrogen may be applied by this method at the rate of about 30 pounds per acre with one acre-inch of water. A good program would include about 200 pounds of nitrogen per acre for corn. Half the amount should be applied as preplant or starter and the remainder through the irrigation system in three applications during the growing season.

Applying phosphorous and potash through an irrigation system is not practical at this time. These nutrients do not move into the soil effectively, but remain on the surface away from the roots.

Applying herbicides through the center pivot sprinkler system is economical and effective. This is commonly called "herbigation." The same holding tank used for nitrogen may be used. The optimum amount of water for weed control is one-half to three-quarters inch before or immediately after planting--before weeds or corn germinate.

Equipment for herbicide application through the irrigation system may cost another $1,000 or can be rented from the cooperative. Sutan and atrazine combination herbicides are examples of material to control the major grasses and broadleaf weeds.

Spraying Services

Cooperative dealers in the Northwest rent boom sprayers for a $30 minimum plus 65 cents for the first 100 acres and 60 cents per acre over 100 acres. Boom sprayers with foam-makers rent for $35 minimum plus 75 cents per acre for the first 100 acres and 60 cents per acre over 100 acres. Aqua applicators with 12-inch shank spacing rent for $25 minimum plus 60 cents per acre, while aqua applicators with 6-inch shank spacing rent for $30 minimum plus 75 cents per acre for any amount. Dry pesticide applicators rent for $25 minimum plus 80 cents per acre with an additional minimum charge of $5 for the foam-makers. Cooperative custom application costs, on the average, an additional $50 per day.

Custom Transportation and Truck-Leasing Services

Many farmers sell their raw products as quickly as possible after harvest and for whatever price they can get. The remainder is sold at fresh market grades, even though more than 50 percent of present marketing is through processing channels. The demands on the food processor, however, are substantially different and add up to extended conversion, preparation, and packaging that may reduce the farmer's share of the marketing dollar.

About 20 large industrial food processors basically control the majority of product or brand franchises in the marketplace, other than farmer cooperatives involved in processing and marketing. Agricultural producers generally have refrained from competition in direct marketing to these firms, but a few years ago a large Oregon-based cooperative began a service to coordinate production and marketing through storage and distribution of farm products to markets with greatest demand in order to increase farmers' receipts.

This cooperative, with storage facilities and a large transport fleet--both owned and leased--distributes its members' products and other cooperative members' products to markets with greatest demands. Other services include selling and bargaining for

the best price for cooperative members' products. The cooperative also distributes products for other cooperatives through both custom and leasing arrangements for transportation. Fresh products, as well as canned and processed foods, are distributed to both wholesale and retail outlets and to large chain stores under prior contract arrangements.

CONCLUSIONS

The independent nature of farmers, plus the economic advantages of having machinery to plant and harvest crops on time, have persuaded the farmers, over the years, that they should own their machinery and equipment. This inclination is supported during good times in farming, which means good prices for his products. At other times, farmers often question the wisdom of owning all machinery needed. But in most communities, little machinery has been available for lease, rates seemed high, and the cash layout always seemed to come at the wrong time. Now that PCAs have initiated a machinery-leasing program in four States, more cooperative dealers in the area have leasing programs, and machinery dealers and manufacturers are setting up better programs to aid the farmer.

The question has always been, when should I buy and when should I lease? Many variables affect and determine this decision, including the projected use of a second or third tractor on the farm. Some general guidelines of tractor ownership-versus-tractor lease may be found in the appendix tables.

In the past, analyses of leasing-versus-ownership nearly always figured in the cost of the machinery at list price. Farmers contend that the trade-in difference, or deal price, which tends to lower ownership costs, is a more accurate and practical measure; thus, leasing costs should be measured against the "deal" price, which averages about 75 percent of new or bid price. On this basis, it was found more economical to lease any tractor used less than 250 hours annually and more economical to lease a large tractor used less than 500 hours annually.

In effect, the "deal" price credits the salvage value which equals trade-in value, so that fixed costs are neither charged to the new list price nor are they averaged over the 8-year life of the tractor. Thus, fixed costs are higher in the early years of ownership--as they are in actual practice--and decline as the tractor ages. Realistic costs in the early years of ownership are also in keeping with comparable lease costs of new or nearly new farm machinery.

Farmers should look hard for ways to reduce production and machinery costs, when grain prices are below parity and machinery costs are high by comparison. Because leasing is a viable alternative to rising costs, more cooperatives, PCAs, and machinery dealers are in the leasing business today. By locating leasing centers close to the farmer and by promoting machinery exchange between regional and area headquarters, investment, as well as transport costs, are reduced. Thus, for many farmers, leasing some machinery and equipment is more economical than a purchase. Simply by putting a pencil to paper, farmers and managers can decide whether to lease or purchase farm machinery.

Appendix table 1--Total annual costs of ownership of new farm tractors, 1977

Tractor horsepower	New cost	First year fixed cost 1/				Total
		Depreciation	Interest	Taxes	Insurance	
		Dollars				
40	8,000	1,000	720	160	120	2,000
60	12,000	1,500	1,080	240	180	3,000
80	15,000	1,870	1,350	300	225	3,745
100	22,000	2,750	1,980	440	330	5,500
120	27,000	3,370	2,430	540	405	6,745
160	30,000	3,750	2,700	600	450	7,500
200	40,000	5,000	3,600	800	600	10,000

1/ Fixed cost percentages: depreciation, 12.5; interest, 9; taxes, 2; and insurance, 1.5.

Appendix table 2--Fixed costs of ownership per hour of annual use for different-size new tractors, 1977

Tractor horsepower	Annual fixed cost 1/	Annual hours of use				
		125	250	500	750	1,000
		Dollars				
40	2,000	16.00	8.00	4.00	2.67	2.00
60	3,000	24.00	12.00	6.00	4.00	3.00
80	3,745	30.00	15.00	7.50	5.00	3.75
100	5,500	44.00	22.00	11.00	7.33	5.50
120	6,745	54.00	27.00	13.50	9.00	6.75
160	7,500	60.00	30.00	15.00	10.00	7.50
200	10,000	80.00	40.00	20.00	13.33	10.00

1/ Does not include operating costs.

Appendix table 3--New tractor ownership costs compared to leasing costs per hour of annual use, 1977

Tractor horsepower	Annual hours of use							
	125		250		500		700	
	Own 1/	Lease 2/	Own	Lease	Own	Lease	Own	Lease
	Dollars							
40	16.00	8.00	8.00	7.00	4.00	5.50	2.67	5.00
60	24.00	9.00	12.00	8.00	6.00	6.50	4.00	6.00
80	30.00	10.00	15.00	9.00	7.50	7.50	5.00	7.00
100	44.00	12.00	22.00	10.00	11.00	8.50	7.33	8.00
120	54.00	14.00	27.00	12.00	13.50	10.50	9.00	9.75
160	60.00	17.00	30.00	15.00	15.00	13.50	10.00	12.50
200	80.00	20.00	40.00	18.00	20.00	17.00	13.33	15.50

1/ Ownership costs include depreciation, interest, taxes, and insurance.
2/ Average of leasing rates charged by PCAs and supply cooperative dealers.

Appendix table 4--New tractor costs based on the "trade-in difference" or "deal" price, 1977

Tractor horsepower	New or list price	Annual fixed cost	Trade-in or "deal" price	Annual fixed cost	Difference in cost of ownership
	Dollars				
40	8,000	2,000	6,000	1,500	500
60	12,000	3,000	9,000	2,250	750
80	15,000	3,745	11,255	2,814	931
100	22,000	5,500	16,500	4,125	1,375
120	27,000	6,745	20,250	5,062	1,683
160	30,000	7,500	22,500	5,625	1,875
200	40,000	10,000	30,000	7,500	2,500

Appendix table 5--New tractor ownership costs based on "deal" price compared to leasing costs per hour of annual use in 1977

Tractor horsepower	Trade-in deal price	Annual fixed cost	Annual hours of use					
			125		250		500	
			Own	Lease	Own	Lease	Own	Lease
			Dollars					
40	6,400	1,600	12.80	8.00	6.40	7.00	3.20	5.50
60	9,600	2,400	19.40	9.00	9.60	8.00	4,80	6.50
80	12,000	3,000	24.00	10.00	12.00	9.00	6.00	7.50
100	17,600	4,400	35.20	12.00	17.60	10.00	8.80	8.50
120	21,600	5,400	43.20	14.00	21.60	12.00	10.80	10.50
160	24,000	6,000	48.00	17.00	24.00	15.00	12.00	13.50
200	32,000	8,000	64.00	20.00	32.00	18.00	16.00	17.00

Appendix table 6--Depreciated tractor values for 5 years and annual fixed costs after 5 years

Tractor horsepower	New cost	Depreciated value				Annual fixed cost
		Second year	Third year	Fourth year	Fifth year	
	Dollars					
40	8,000	7,000	6,125	5,360	4,690	1,173
80	15,000	13,130	11,489	10,053	8,796	2,199
120	27,500	23,630	20,676	18,091	15,830	3,957
200	40,000	35,000	30,625	26,797	23,447	5,862

Appendix table 7--Annual fixed cost for 5 years

Tractor horsepower	New cost	Depreciated value				Annual fixed cost
		Second year	Third year	Fourth year	Fifth year	
	Dollars					
40	8,000	2,000	1,750	1,531	1,340	1,173
80	15,000	3,745	3,282	2,872	2,513	2,199
120	27,000	6,745	5,907	5,169	4,523	3,957
200	40,000	10,000	8,750	7,656	6,699	5,862

Appendix table 8--Depreciated value and annual fixed cost for first, third, and fifth years of ownership

Tractor horsepower	First year		Third year		Fifth year	
	Depreciated value	Fixed cost	Depreciated value	Fixed cost	Depreciated value	Fixed cost
	Dollars					
40	8,000	2,000	6,125	1,531	4,690	1,173
80	15,000	3,745	11,489	2,872	8,796	2,199
120	27,000	6,745	20,676	5,169	15,830	3,957
200	40,000	10,000	30,625	7,656	23,447	5,862

Appendix table 9--Cost per use-hour of ownership for 3-year-old tractors (five sizes) at different levels of annual use

Tractor horsepower	Third year's fixed cost	Annual hours of use				
		125	250	500	750	1,000
	Dollars					
40	1,531	12.25	6.12	3.00	2.04	1.53
80	2,872	23.00	11.50	5.75	3.83	2.87
120	5,169	41.35	20.68	10.34	6.89	5.17
200	7,656	61.25	30.62	15.31	10.21	7.66

Appendix table 10--Cost per use-hour of ownership for 5-year-old tractors (four sizes) at different levels of annual use

Tractor horsepower	Third year's fixed cost	Annual hours of use				
		125	250	500	750	1,000
	Dollars					
40	1,173	9.54	4.69	2.35	1.56	1.17
80	2,199	17.60	8.80	4.40	2.93	2.20
120	3,957	31.66	15.83	7.91	5.27	3.95
200	5,862	46.89	23.45	11.72	7.82	5.86

Appendix table 11--Tractor ownership costs compared to leasing costs per hour of annual use for 3-year-old tractors (four sizes)

Tractor horsepower	125 hours		250 hours		500 hours	
	Own	Lease	Own	Lease	Own	Lease
	Dollars					
40	12.25	8.00	6.12	7.00	3.06	5.00
80	23.00	10.00	11.50	9.00	5.75	7.50
120	41.35	14.00	20.68	12.00	10.34	10.50
200	61.25	20.00	30.12	18.00	15.31	17.00

Appendix table 12--Tractor ownership costs compared to leasing costs per hour of annual use for 5-year-old tractors (four sizes)

Tractor horsepower	125 hours		250 hours		500 hours	
	Own	Lease	Own	Lease	Own	Lease
	Dollars					
40	9.54	8.00	4.69	7.00	2.35	5.50
80	17.60	10.00	8.80	9.00	4.40	7.50
120	31.66	14.00	15.83	12.00	7.91	10.50
200	46.89	20.00	23.45	18.00	11.72	17.00

Appendix table 13--Rental and operating costs per hour for a new 125 DBHP crawler tractor used 1,200 hours per year, 1977

Item	Cost per hour
	Dollars
Rental rate	11.00
Variable cost incurred by rentor	
Repairs--included in rental rate	
Fuel: 8 gallons per hour x 42 cents per	3.36
Lubricants: 50% of new D6 lubricant cost (Filters are included in rental rate)	.25
Labor: operator wage, including overhead	4.00
Total cost per hour of operation	18.61

U. S. GOVERNMENT PRINTING OFFICE : 1979 O - 304-968

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF
AGRICULTURE
AGR 101
THIRD CLASS

COOPERATIVE PROGRAM
Economics, Statistics, and Cooperatives Service

The Cooperative Program of ESCS provides research, management, and educational assistance to cooperatives to strengthen the economic position of farmers and other rural residents. It works directly with cooperative leaders and Federal and State agencies to improve organization, leadership, and operation of cooperatives and to give guidance to further development.

The program (1) helps farmers and other rural residents obtain supplies and services at lower cost and to get better prices for products they sell; (2) advises rural residents on developing existing resources through cooperative action to enhance rural living; (3) helps cooperatives improve services and operating efficiency; (4) informs members, directors, employees, and the public on how cooperatives work and benefit their members and their communities; and (5) encourages international cooperative programs.

The program publishes research and education materials and issues Farmer Cooperatives. All programs and activities are conducted on a nondiscriminatory basis, without regard to race, creed, color, sex, or national origin.